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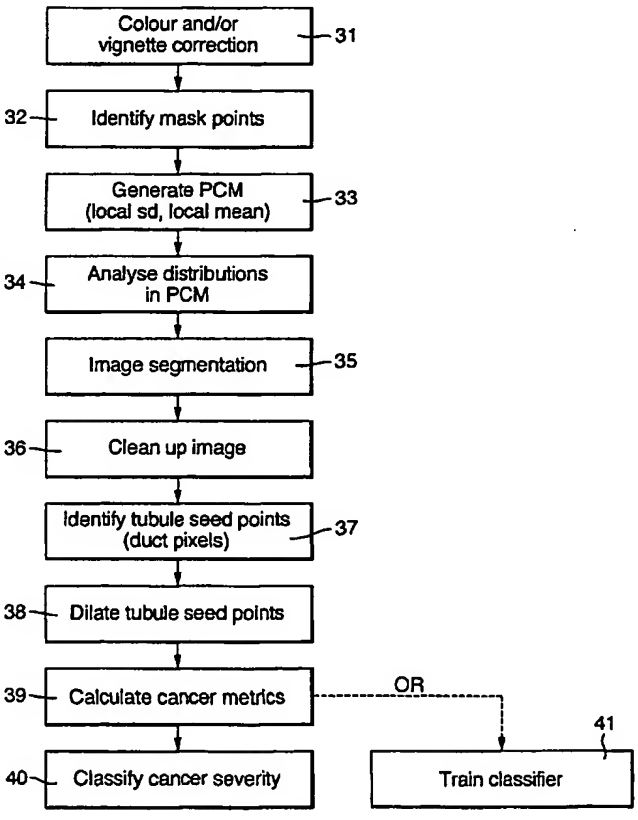
(54) Title: IMAGE ANALYSIS




(57) Abstract: A method for the automated analysis of digital images, particularly for the purpose of assessing the presence and severity of cancer in breast tissue based on the relative proportions of tubule formations and epithelial cells identified in digital images of histological slides. The method includes the step of generating a property co-occurrence matrix (PCM) from some or all of the pixels in the image, using the properties of local mean and local standard deviation of intensity in neighbourhoods of the selected pixels, and segmenting the image by labelling the selected pixels as belonging to specified classes based upon analysis of the PCM. In this way relatively dark and substantially textured regions representing epithelial cells in the image can be distinguished from lighter and more uniform background regions. Other steps include identifying groups of pixels representing duct cells in the image based on intensity, shape and size criteria, dilating those pixels into surrounding groups labelled as epithelial cells by a dimension to correspond to an overall tubule formation, and calculating a metric based on the ratio of the number of duct pixels after such dilation to the total number of duct and epithelial pixels. Other uses for the method could include the analysis of mineral samples containing certain types of crystal formations.

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